

N42237.AR.000501
NSB KINGS BAY
5090.3a

LETTER WITH ATTACHED CHANGE PAGES REGARDING WORK PLAN FOR
GROUNDWATER REMEDIATION AT SITE 11 NSB KINGS BAY GA
9/14/2001
NSB KINGS BAY



DEPARTMENT OF THE NAVY

NAVAL SUBMARINE BASE
1063 USS TENNESSEE AVENUE
KINGS BAY, GEORGIA 31547-2606

31547-000
09.01.00.0169

IN REPLY REFER TO:

5090

Ser FE4/2165

14 SEP 2001

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Bruce Khaleghi
Georgia Department of Natural Resources
Environmental Protection Division
205 Butler Street, SE, Suite 1252
Atlanta, GA 30334

Dear Mr. Khaleghi:

This submits change pages to our Work Plan No. 2 for Groundwater Remediation at Site 11, Old Camden County Landfill, per your letter of August 10, 2001:

a. Specific replies to your comments are attached as enclosure (1).

b. Please remove the title page and replace it with enclosure (2).

c. Please remove the table of contents, pages II and III, and replace it with enclosure (3).

d. Please remove section 1, pages 1-1 through 1-10 and replace it with enclosure (4). This includes a revised figure 1-3.

e. Please remove section 2, pages 2-6 and 2-7, and replace them with enclosure (5).

f. Please remove section 3, pages 3-3 through 3-5, and replace them with enclosure (6).

g. Please remove section 6, pages 6-1 and 6-2, and replace it with enclosure (7).

h. Please remove these pages from appendix d, Health and Safety Plan, and replace them with enclosure (8).

i. Please replace the binder labels with enclosure (9).


FE4 / PFI / KY

5090
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I certify under penalty of law that this document and all attachments were prepared under my direct supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

The SUBASE Kings Bay point of contact is Ken Yargus, (912) 673-2001, extension 1217. Please address all correspondence to "Commanding Officer, Naval Submarine Base, Kings Bay, 1063 USS TENNESSEE Avenue, Kings Bay, GA 31547-2606."

Sincerely,



JOHN R. GARNER
Leader, Environmental Division
Facilities & Environmental
By direction of the
Commanding Officer

- Enclosures:
1. Specific replies to comments
 2. Revised title page
 3. Revised table of contents, pages II and III
 4. Revised section 1, pages 1-1 through 1-10
 5. Revised section 2, pages 2-6 and 2-7
 6. Revised section 3, pages 3-3 through 3-5
 7. Revised section 6, pages 6-1 and 6-2
 8. Revised Appendix D, Health and Safety Plan
 9. Revised binder labels

Copy to: (w/o encl)
SOUTHNAVENGCOM (Anthony Robinson)
COMNAVREG SE (Laila Capers)
J.A. Jones Environmental Services (Sam Ross)
J.A. Jones Environmental (SUBASE) (Kim Owens)



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Constructors Inc

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September 6, 2001

Mr. Anthony Robinson
Southern Division, Naval Facilities Engineering Command
P.O. Box 190010
North Charleston, SC 29419-9010

RE: Contract No. N62467-98-D-0995
Contract Task Order No. 0047 – Naval Submarine Base (NSB) Kings Bay, Georgia
Response to Georgia Department of Natural Resources, Environmental Protection
Division Comments on the Work Plan No. 02 for Groundwater Remediation at Site
11, Old Camden County Landfill

Dear Mr. Robinson:

CH2M HILL Constructors, Inc. is pleased to provide below the response to Georgia Department of Natural Resources, Environmental Protection Division comments on the Work Plan No. 02 for Groundwater Remediation at Site 11, Old Camden County Landfill, NSB Kings Bay, Georgia.

Comment No. 01: Section 1, Figure 1-3: This Figure is misleading and possibly erroneous in several aspects, including the following:

- a. The "zero" concentration isopleth has nonzero data outside its bounds.
- b. The isopleth indicated as "32,000" and the unmarked 18,000 isopleth near SP-35 have no data points within to support the conclusion that these are closed contours.
- c. The 10,000, 12,000, and 14,000 isopleths between SP-03 and SP-37 intercept.

Response No. 01: Figure 1-3 has been revised and the replacement page is enclosed.

Comment No. 02: Section 2.1.2, Appendix A: The Work Plan proposes locations for the vegetable-oil injectors, but not the chemical oxidation injectors. Section 2.1.2 states, "The chemical oxidation injector parameters (actual number, placement, and construction details)...are vendor-specific and will be determined by the selected chemical oxidation injection vendor at a later date." However, the CPM Project Schedule (Appendix A) does not provide for EPD review of the proposed injector parameters and placement once the vendor

determines what they are. Ideally, EPD should have a chance to review the proposed injector parameters and placement before they are installed. However, adding an extra review step could delay corrective action activities by several weeks or months, possibly detracting from ultimate system performance. Therefore, EPD should allow NSB to proceed in the most expedient manner, but EPD will closely monitor system performance with respect to the designated criteria.

Response No. 02: The chemical oxidation injection plan, including the chemical oxidation injector parameters, will be submitted to the EPD for review, and information when the plan is received from the chemical oxidation vendor.

Comment No. 03: Section 2.1.3: The last paragraph of Section 2.1.3 states, "Vegetable oil injection will address the anticipated slight contaminant rebound following chemical oxidation injections and will preclude the further necessity of in-depth investigations at the site", but the Work Plan does not identify the performance criterion to use in evaluating this claim. In other words, does NSB expect the vegetable oil injection to completely eliminate the cVOC rebound or are cVOC concentrations expected to rebound, but below a certain threshold level? If the performance criterion is the baseline criterion in the CAP for monitored natural attenuation (maximum source-area cVOC concentration of 100 ppb), then the Work Plan should state that.

Response No. 03: There is no established performance criterion for this chemical oxidation injection event. The chemical oxidation injection event will address the source area contamination, with the vegetable oil injection addressing the remaining groundwater contamination in the treatment area.

Comment No. 04: Section 3.4.1, Analytical Methods: Jeff Wilmoth's title and role in this project are unclear. Please include this information in this or other sections on the Work Plan.

Response No. 04: Jeff Wilmoth is the CH2M Hill Constructors, Inc. Laboratory Coordinator/Data Management Manager, and is responsible for reviewing all laboratory analytical data for quality assurance/quality control purposes. His role has been added to Section 3.4.1, Analytical Methods.

Comment No. 05: Appendix D, Health and Safety Plan: NSB should address the following deficiencies in the Health and Safety Plan (HASP):

- a. Section 3.3 and 3.4 of the HASP list the following biological hazards: snakes, poison ivy/oak/sumac, blood borne pathogens from waste, bees and other stinging insects and ticks. Section 3.4 is devoted specifically to tick bites and the danger of Rocky Mountain spotted fever and Lyme disease. However, the HASP

does not mention the hazard posed by mosquitoes. Diseases including several types of encephalitis, such as that caused by the West Nile virus, are transmittable through mosquitoes and have been reported recently in Georgia. The HASP should therefore address the mosquito hazard.


- b. Section 3.7 of the HASP lists the contaminants of concern as 1,2-DCE, PCE, and TCE. However, vinyl chloride was present in some of the source-area characterization samples (See Table 1-3 of Work Plan). The aggressive nature of the Fenton's reaction is such that volatilization will be likely of any vinyl chloride present, with consequent possible exposure by the site workers. The HASP should therefore address vinyl chloride.

Response No. 05: The hazards posed by mosquitoes have been added to Section 3.4.2, Mosquito Bites and vinyl chloride has been added to Section 3.7, Contaminants of Concern.

If you have any questions or comments regarding the enclosed, please do not hesitate to contact Mike Halil at (904) 777-4812 or at mhalil@vnet.net.

Sincerely,

CH2M HILL Constructors, Inc.


Michael Halil, E.I.T.
Project Engineer

cc: Larry Blackburn, SOUTHDIV
John Garner, NSB Kings Bay
CCI File No. 160027

Work Plan No. 02
Groundwater Remediation at Site 11
Old Camden County Landfill

Naval Submarine Base Kings Bay
Kings Bay, Georgia

Revision No. 01

Contract No. N62467-98-D-0995
Contract Task Order No. 0047

Submitted to:
U.S. Naval Facilities
Engineering Command
Southern Division

Prepared by:



CH2MHILL
Constructors, Inc.

115 Perimeter Center Place, N.E.
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September 2001

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C	Testing Plan and Log
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1.0 Introduction

CH2M HILL Constructors, Inc. (CCI) with J.A. Jones Environmental Services Company (J.A. Jones) have been contracted by the Department of the Navy, Southern Division Naval Facilities Engineering Command (NAVFAC), to prepare this site-specific Work Plan, under Response Action Contract No. N62467-98-D-0995, Contract Task Order (CTO) No. 0047. The purpose of this Work Plan is to outline the procedures to be used to perform groundwater remediation at Site 11, Old Camden County Landfill (Site 11) located at Naval Submarine Base (NSB) Kings Bay, Georgia.

The scope of work under this CTO is to perform groundwater remediation in the delineated source area at Site 11 utilizing Fenton's reagent chemical oxidation injection followed by an injection of vegetable oil into the subsurface.

This Work Plan is organized into six sections of text and five appendices as follows.

Section 1.0 Introduction includes the site history, a summary of the source area delineation effort, and the project objectives.

Section 2.0 Project Execution Plan details the required scope of work, the project schedule, the communications plan, and the traffic control plan. A detailed project schedule is provided in Appendix A.

Section 3.0 Sampling and Analysis Plan (SAP) provides project sample locations, sample collection frequency, and the required laboratory analyses for samples collected during project activities.

Section 4.0 Waste Management Plan discusses the characterization, disposal, onsite management, and transportation of wastes (i.e., decontamination water, etc.) encountered or generated during project activities. Waste management forms are provided in Appendix B of CTO No. 0047 Work Plan No. 01 (CCI, August 2000).

Section 5.0 Environmental Protection Plan of CTO No. 0047 Work Plan No. 01 addresses environmental protection for all work completed at NSB Kings Bay.

Section 6.0 Quality Control (QC) Plan of CTO No. 0047 Work Plan No. 01 addresses QC for all work completed at NSB Kings Bay. The site-specific project organization for this CTO is included in Section 6.0 Quality Control Plan of this Work Plan No. 02. The Submittal Register and Testing Plan and Log for this phase of the CTO are provided in Appendices B and C, respectively. Additional project QC documents are provided in Appendix C of the CTO No. 0047 Work Plan No. 01.

The **Site Health and Safety Plan**, provided as a standalone document in Appendix D, addresses project-specific health and safety issues for the remediation activities to be completed at NSB Kings Bay.

Source delineation analytical and membrane interface probe results are provided in Appendix E.

1.1 Site History and Project Objectives

NSB Kings Bay occupies approximately 16,168 acres in Camden County, Georgia. Site 11 is identified as the Old Camden County Landfill, which is now incorporated in NSB Kings Bay. The Old Camden County Landfill was used for municipal solid waste disposal in the 1960s and 1970s. Waste was disposed of by digging trenches, filling the trenches with waste, and then backfilling the trenches with fill. Tetrachloroethene (PCE) was disposed in the landfill at some point during waste disposal activities, which resulted in groundwater contamination at the site. The contaminants of concern at Site 11 include chlorinated volatile organic compounds (VOCs), specifically PCE, and its degradation constituents trichloroethene (TCE), cis-1,2-dichloroethene (DCE), and vinyl chloride (VC).

Bechtel Environmental, Inc. (BEI), with Geo-Cleanse International, Inc., performed three phases of chemical oxidation treatment during August 1998 through April 2000. During the entire treatment program, a total of 54 injectors were installed and an approximate total of 34,850 gallons of 50 percent hydrogen peroxide and an equivalent amount of ferrous iron catalyst were delivered to the subsurface.

Phase I chemical oxidation treatment was performed from August 1998 through February 1999. Because of a concentration increase in three piezometers and Injector I-14 following Phase I treatment, BEI conducted a cone penetration testing program in April 1999 to confirm and delineate the horizontal extent of dissolved groundwater contamination.

Phase II chemical oxidation treatment was performed from May 1999 to July 1999 on areas east and west of the Phase I area of concern. Because of a concentration rebound in Injector I-14 following the Phase II treatment, BEI conducted a Geoprobe investigation in August 1999 to investigate and locate the potential new source of PCE at Injector I-14. Excavation of the suspected source area near Injector I-14 was conducted in September 1999. The excavation yielded several 5-gallon containers, one containing a gray-colored, paint looking waste, and one approximate 20-gallon container containing a black sludge type waste. Analysis of the black waste showed PCE with the highest concentration of all compounds tested.

Phase III chemical oxidation treatment was performed from January 2000 to April 2000 on the delineated source area southeast of Injector I-14. Based on the analytical results from the post-Phase III sampling event conducted on May 30, 2000, a source area of PCE contamination appeared to remain beneath the Phase III injectors.

The post-Phase III sampling event analytical results are summarized in Table 1-1.

TABLE 1-1
Post-Phase III Sampling Event Analytical Results

Injector ID	Concentration in micrograms per liter ($\mu\text{g/L}$)				
	PCE	TCE	cis-1,2-DCE	VC	Total Chlorinated Ethenes (TCLE)
I-11	170.0	7.0	6.5I	5U	177.0
I-12	47.0	1.8I	1U	1U	47.0
I-13	41.0	5U	5U	5U	41.0
I-14	32.0	2.8	1.6I	1U	34.8
I-18	99.0	1.6I	1U	1U	99.0
I-24	13.0	1.4I	1.3I	1U	13.0
I-25	81.0	1U	2.0	1U	83.0
I-26	49.0	1U	1.5I	1U	49.0
I-60	10,000.0	100U	100U	100U	10,000.0
I-61	820.0	20U	20U	20U	820.0
I-62	120.0	5U	5U	5U	120.0
I-63	130.0	5U	5U	5U	130.0
I-64	92.0	5U	5U	5U	92.0
I-65	210.0	5U	5U	5U	210.0
I-66	260.0	5U	5U	5U	260.0
I-67	72.0	5U	5.2I	5U	72.0
I-68	4.0	1U	1U	1U	4.0
I-69	36.0	1.8I	1U	1U	36.0

U denotes compound was analyzed for but not detected to the level shown.

$\mu\text{g/L}$ – micrograms per liter

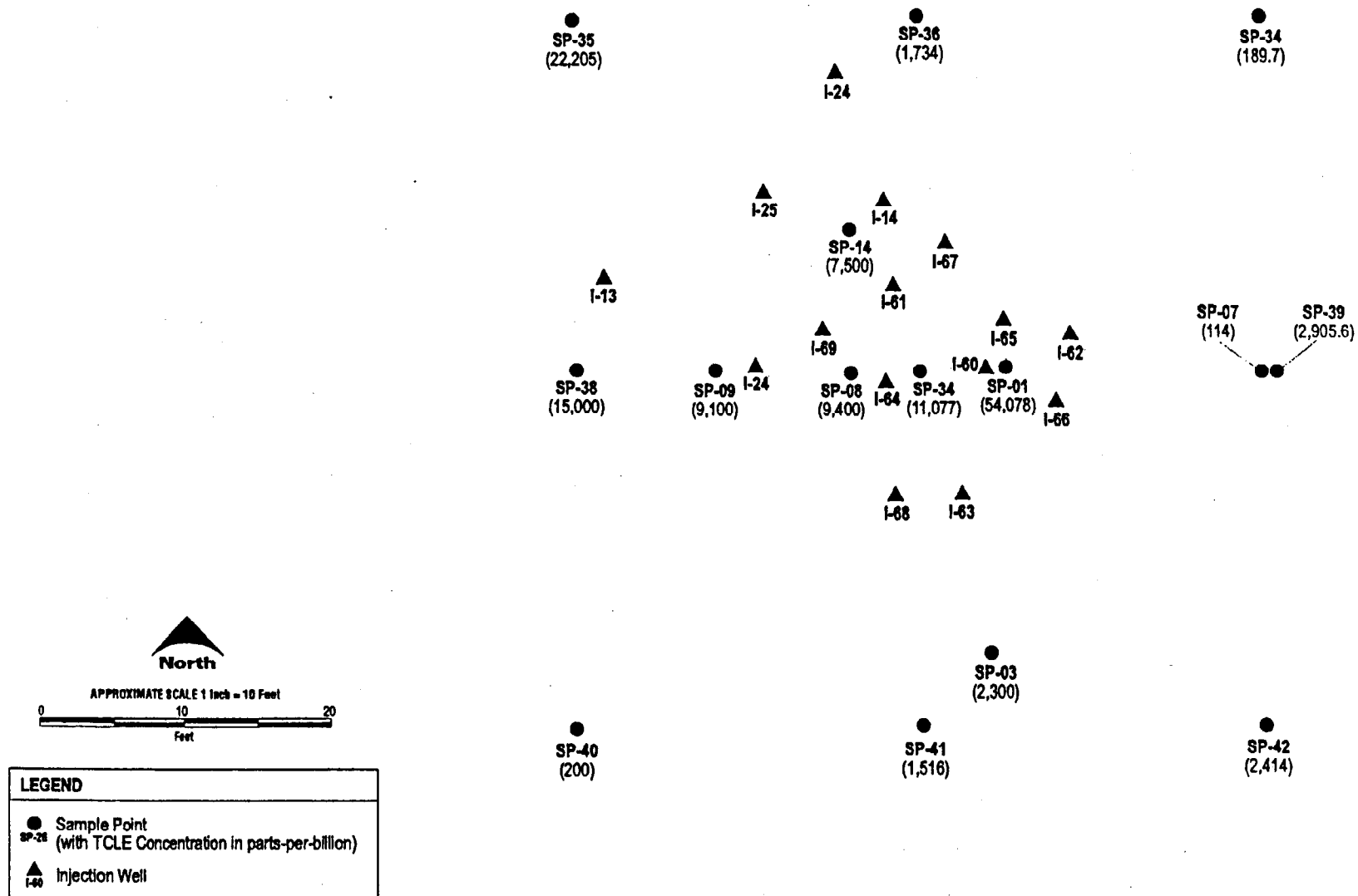
I denotes analyte detected; however, the value is between the method detection limit and the practical quantitation limit.

1.2 Source Area Delineation Effort

A source area delineation effort was conducted by CCI/J.A. Jones from November 6, 2000, through January 12, 2001, to delineate the horizontal and vertical extent of the potential source area PCE contamination (and its degradation products) beneath the Phase III chemical oxidation treatment injectors.

1.2.1 November 6 - 21, 2000 Source Area Delineation Effort

From November 6 - 21, 2000, the source area delineation effort was completed utilizing a membrane interface probe (MIP)/Geoprobe rig with an onsite mobile laboratory. The MIP technology was utilized to provide a vertical profile of the subsurface on a horizontal 10-foot grid from Injector I-60. The MIP is pushed into the ground using the Geoprobe rig at a rate of 1 foot per minute. A soil conductivity sensor on the probe continuously logs the changes in the subsurface conductivity. A thermister on the probe heats the surrounding soil and water, which volatilizes the contaminants causing them to migrate across a permeable membrane and into the probe. A carrier gas transports the volatilized gases to a lab-grade gas chromatograph (GC) at the surface. The GC results log continuously into a computer and display real time. The MIP data was used to determine the groundwater sample collection locations and intervals. The groundwater sample collection locations are shown on Figures 1-1 and 1-2 and the MIP data and groundwater sample collection intervals and onsite mobile laboratory analytical results are summarized in Table 1-2. The MIP data and onsite mobile laboratory analytical results are provided in Appendix E.



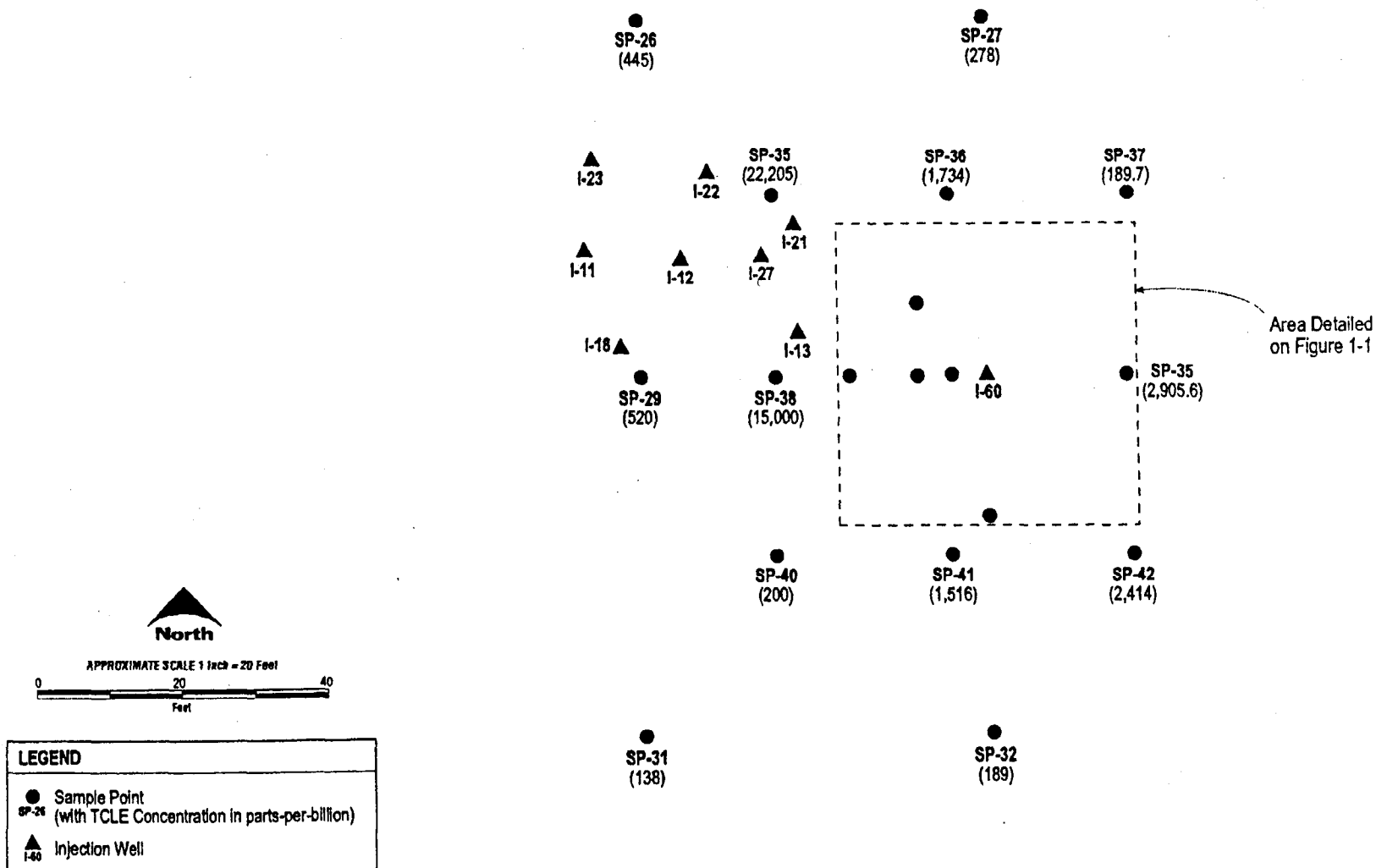


Figure 1-2
Source Area Delineation Site Plan No. 2
NSB Kings Bay, Georgia

TABLE 1-2
November 6 – 12, 2000 Source Area Delineation Results

Sample Location ID	Sample Collection Interval (feet bls)	Summary of Total Chlorinated Ethenes					TCLE	Total VOCs	Maximum MIP Reading (uV)
		VC	Cis-1,2-DCE	trans-1,2-DCE	TCE	PCE			
SP-01	20 to 24	<2	17	<2	24	61	102	102	1.6E+7/3.7E+6
	36 to 40	<2	15	<2	19	180	214	214	1.60E+07
	40 to 44	<2	<2	<2	19	550	569	569	3.80E+06
	44 to 48	<2	7	<2	46	54,000	54,053	54,078	5.80E+06
	48 to 52	<2	45	<2	4	790	839	857	1.50E+06
	52 to 56	<2	40	<2	<2	8	48	90	--
	56 to 60	<2	3	<2	<2	2 J	5	27	--
SP-03	35 to 39	<200	<200	<200	<200	2,300	2,300	2,300	4.30E+06
SP-07	44 to 48	<2	71	<2	<2	2 J	73	114	--
	48 to 52	<2	44	<2	<2	1 J	45	102	--
SP-08	44 to 48	<200	<200	<200	<200	9,400	9,400	9,400	1E+7/3.5E+5
	48 to 52	<20	48	<20	<20	2,900	2,948	3,019	1E+7/2.5E+5
	52 to 56	<2	27	<2	<2	4	31	61	--
	56 to 60	<2	13	<2	<2	1 J	14	37	--
SP-09	44 to 48	<200	<200	<200	<200	9,100	9,100	9,100	2.40E+06
	48 to 52	<200	<200	<200	<200	150 J	150	150	1.50E+06
SP-14	44 to 48	<200	<200	<200	<200	7,500	7,500	7,500	4.80E+06
	48 to 52	<20	22	<20	<20	950	972	972	6.50E+06
	52 to 56	<2	17	<2	<2	1 J	18	47	--
SP-26	44 to 48	<20	15 J	<20	<20	430	445	445	--
SP-27	44 to 48	<20	100	<20	<20	100	200	278	--
	48 to 52	<2	17	<2	<2	<2	17	42	--
SP-29	44 to 48	<200	<200	<200	<200	300	300	300	--
	48 to 52	<200	<200	<200	<200	520	520	520	--
SP-31	44 to 48	<2	25	<2	<2	<2	25	80	--
	48 to 52	<2	43	<2	1 J	<2	44	138	--
SP-32	36 to 40	<2	<2	<2	<2	<2	--	15	--
	41 to 45	<2	3	<2	<2	<2	3	47	--
	46 to 50	<2	58	<2	<2	<2	58	189	--

Notes:

J: J qualifier denotes the concentration is estimated.

bls: below land surface

DCE: Dichloroethene

TCE: Trichloroethene

PCE: Tetrachloroethene

TCLE: Total Chlorinated Ethenes

VOCs: Volatile Organic Compounds

MIP: Membrane Interface Probe

uV: microvolts

All concentrations reported in micrograms per liter (µg/L), unless otherwise noted.

TCLE is defined as the summation of PCE, TCE, DCE, and Vinyl Chloride.

Total VOCs is defined as the sum of all detected constituents by USEPA Method 8021B.

Initially, groundwater samples were collected on a horizontal 10-foot grid from Injector I-60, but based on the initial groundwater sample analytical results, the spacing was increased to a 50-foot grid to locate a "clean" boundary. Groundwater samples were collected from each boring using the Geoprobe rig with peristaltic sampling pump and analyzed by the onsite mobile laboratory for U. S. Environmental Protection Agency (USEPA) SW-846 Method 8021B. Each boring was abandoned immediately following MIP boring or groundwater sample collection by sealing the boring with grout from the bottom of the boring to the ground surface using a tremie pipe.

Based on the groundwater sample analytical results collected during this initial effort, the vertical interval of contamination in the source area was determined to be from 44 to 48 feet below land surface (bls); however, additional groundwater collection sampling and analysis was determined to be necessary to delineate the horizontal extent of contamination.

1.2.2 January 8 - 12, 2001 Source Area Delineation Effort

From January 8 through 12, 2001, the source area delineation effort was completed utilizing a Geoprobe rig with an offsite laboratory. Groundwater samples were collected on a 25-foot grid centered 5 feet to the west of Injector I-60, with samples collected from each of nine borings at depths of 36 to 40 feet bls, 40 to 44 feet bls, 44 to 48 feet bls, and 48 to 52 feet bls and analyzed by an offsite laboratory for USEPA SW-846 Method 8021B.

The groundwater sample collection locations are shown on Figures 1-1 and 1-2 and the groundwater sample collection intervals and offsite laboratory analytical results are summarized in Table 1-3. The offsite laboratory analytical results are provided in Appendix D. Each boring was abandoned immediately following groundwater sample collection by sealing the boring with grout from the bottom of the boring to the ground surface using a tremie pipe.

In addition to the above delineation effort, Injector I-60 was sampled on February 7, 2001, and analyzed by an offsite laboratory for USEPA SW-846 Method 8021B. The offsite laboratory analytical results for this event are provided in Appendix D, and the results are summarized in Table 1-3.

This delineation effort, along with the initial effort, provided sufficient data to determine the horizontal extent of contamination and the area requiring remediation. The data collected during the delineation efforts is consistent with a small amount of contaminate mass remaining in the subsurface. Based on the site studies to date, natural attenuation processes are working faster than the groundwater contaminants are migrating, however, the development of a chemical oxidation/vegetable oil injection strategy through the use of the source area delineation analytical results is an aggressive action to quickly achieve the groundwater remedial goals.

Figure 1-3 is provided to illustrate the groundwater contaminant plume isopleths based on the source area delineation efforts.

TAB 3

January 8-12, 2001 and February 7, 2001 Source Area Delineation Effort Results

Sample Location ID	Sample Collection Interval (feet bls)	Summary of Total Chlorinated Ethenes					TCLE	Total VOCs
		VC	cis-1,2-DCE	trans-1,2-DCE	TCE	PCE		
SP-34	36 to 40	<39	900	<64	430	5,300	6,630.0	6,630.0
	40 to 44	<39	200	<64	<31	5,100	5,300.0	53.1
	44 to 48	<39	77 J	<64	<31	11,000	11,077.0	11,077.0
	48 to 52	3.7	46	<0.64	0.5 J	43	93.2	123.6
SP-35	36 to 40	53	62	8.4	22	56	201.4	201.4
	40 to 44	<3.9	37	<6.4	33	1,300	1,370.0	1,375.9
	44 to 48	<24	150	<12	55	22,000	22,205.0	22,205.0
	48 to 52	<3.9	<0.47	<0.64	25	460	485.0	496.0
SP-36	36 to 40	<0.39	<0.47	<0.63	0.38 J	90	90.4	94.0
	40 to 44	<3.9	24	<6.4	10	1,700	1,734.0	1,742.3
	44 to 48	5.2	340	1.8	1.1	14	362.1	413.5
	48 to 52	2.9	14	<0.23	<0.22	0.42 J	17.3	37.7
SP-37	36 to 40	1.2	0.58 J	<0.23	<0.22	6	7.8	13.4
	40 to 44	5.1	180	0.6 J	0.47 J	3.5	189.7	229.8
	44 to 48	1.3	17	<0.23	<0.22	3.7	22.0	36.2
	48 to 52	3.2	11	<0.23	0.31 J	3.8	18.3	36.7
SP-38	36 to 40	<0.39	6.5	<0.64	7	130	143.5	144.9
	40 to 44	<0.39	2.9	<0.64	1.8	90	94.7	96.5
	44 to 48	<39	<47	<64	<31	15,000	15,000.0	15,000.0
	48 to 52	<39	<47	<64	<31	5,100	5,100.0	5,100.0
SP-39	36 to 40	<3.9	<4.7	<6.4	4.3 J	1,800	1,804.3	1,804.3
	40 to 44	<3.9	<4.7	<6.4	5.6 J	2,900	2,905.6	2,905.6
	44 to 48	0.55 J	8.5	<0.23	<0.22	190	199.1	212.9
	48 to 52	<4.8	<1.4	<2.3	<2.2	680	680.0	686.9
SP-40	36 to 40	<3.9	<4.7	<6.4	<3.1	200	200.0	200.0
	40 to 44	<0.39	<0.47	<0.64	<0.31	11	11.0	13.8
	44 to 48	3.4	71	<0.64	<0.31	2.8	77.2	95.9
	48 to 52	3.6	85	0.73 J	1.3	1.6	92.2	333.0
SP-41	36 to 40	<3.9	<4.7	<6.4	11	1,500	1,511.0	1,511.0
	40 to 44	2.7	26	<0.64	0.76 J	73	102.5	119.2
	44 to 48	<3.9	<4.7	<6.4	16	1,500	1,516.0	1,520.4
	48 to 52	<3.9	<4.7	<6.4	13	1,200	1,213.0	1,213.0
SP-42	36 to 40	<0.48	0.33 J	<0.23	<0.22	0.51 J	0.8	2.6
	40 to 44	<4.8	<1.4	<2.3	14	2,400	2,414.0	2,425.3
	44 to 48	2.8	62	<0.64	0.44 J	3.4	68.6	131.6
	48 to 52	2.5	69	<0.64	0.81 J	<1.2	72.3	342.6
I-60	36 to 39	<0.48	6.0	<0.23	17	130.0	153.0	154.0

Notes:

J: J qualifier denotes the concentration is estimated.

bls: below land surface

DCE: Dichloroethene

TCE: Trichloroethene

PCE: Tetrachloroethene

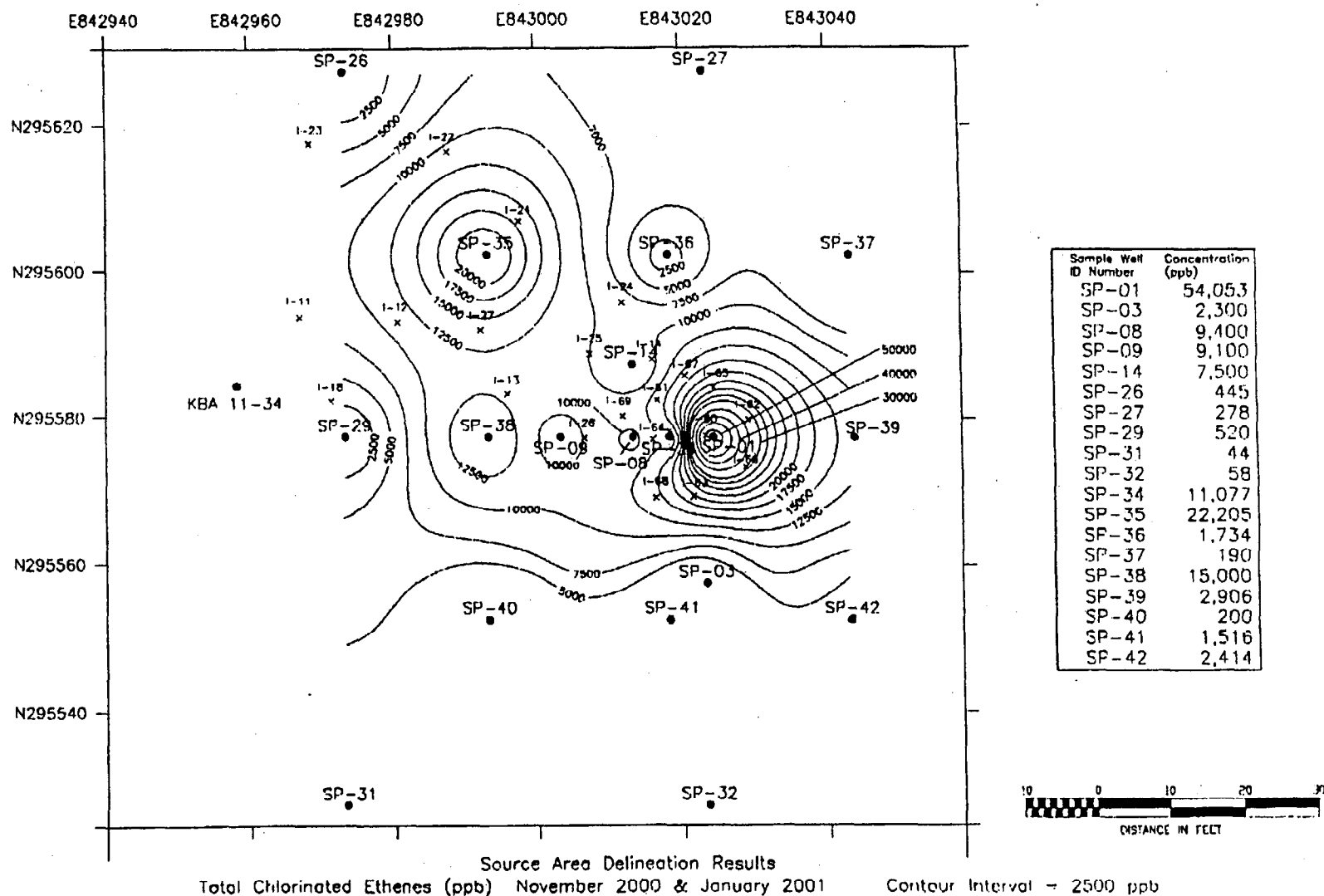
TCLE: Total Chlorinated Ethenes

VOCs: Volatile Organic Compounds

All concentrations reported in micrograms per liter (µg/L)

TCLE is defined as the summation of PCE, TCE, DCE, and Vinyl Chloride.

Total VOCs is defined as the sum of all detected constituents by USEPA Method 8021B.



Courtesy of J.A. Jones Management Services

CH2MHILL
A052001004ATL - Kings Bay 105.FH8

Figure 1-3
Groundwater Containment Plume Isopleth Map
NSB Kings Bay, Georgia

1.3 Project Objectives

The project objective is to utilize the analytical data collected during the source area delineation effort to design and implement a Fenton's reagent chemical oxidation and vegetable oil injection strategy to remediate the groundwater contamination located in the delineated source area at Site 11.

The following documents were utilized by CCI/J.A. Jones in its preparation of this Work Plan:

- Bechtel Environmental, Inc. July 2000. Completion Report for In Situ Chemical Oxidation, July 1998 - July 2000, Site 11, Old Camden County Landfill; NSB Kings Bay, Georgia.
- CCI Constructors, Inc. August 2000. Work Plan for source Delineation at site 11, Old Camden Landfill, Naval Submarine Base Kings Bay, Kings Bay, Georgia.

2.1.5 Decontamination

Personnel and equipment will be properly decontaminated to remove all contamination that may be adhering to personnel or equipment as a result of site activities. Any water accumulated during the decontamination process will be containerized in 55-gallon drums, sampled in accordance with Section 3.0 Sampling and Analysis Plan and managed, transported, and disposed in accordance with Section 4.0 Waste Management Plan. All debris generated by remediation activities will be properly contained and disposed of at a facility permitted to accept the waste. Section 4.0 Waste Management Plan describes the requirements for onsite management and offsite disposal of all wastestreams. Decontamination of personnel and equipment will be performed in accordance with the site-specific Health and Safety Plan provided in Appendix D and the applicable provisions of 29 Code of Federal Regulations (CFR) 1910.120.

2.1.6 Demobilization

Prior to demobilization, an as-built survey of all new chemical oxidation and vegetable oil injection points will be performed to 1983 State Plane Coordinates of Georgia.

During demobilization, temporary facilities, utilities, and equipment will be removed from the site. In addition, any debris or solid waste material remaining from site activities will be removed and properly disposed of offsite in accordance with Section 4.0 Waste Management Plan.

2.2 Project Schedule

The major project activities and estimated durations for each are outlined below.

• Pre-construction Meeting/Submittal Preparation/Reviews	45 days
• Mobilization	2 days
• Pre-Chemical Oxidation Sediment Sampling	1 day
• Injector Installation	3 weeks
• Primary Chemical Oxidation Injection	5 days
• Polish Chemical Oxidation Injection (if necessary)	5 days
• Vegetable Oil Injection	10 days
• Construction Completion Report	30 days

CCI/J.A. Jones anticipates the total project duration (from pre-construction conference through submittal of the Construction Completion Report) will be approximately 120 days. This proposed schedule may vary depending on the actual conditions encountered in the field. Appendix A provides a schedule for the work to be performed.

2.3 Communications Plan

A communication matrix outlining the lines of communications for Southern Division, NAVFAC and CCI/J.A. Jones is presented in Table 2-1. Table 2-2 provides a project personnel directory.

TABLE 2-1

Communications Matrix

CCI/J.A. Jones Position		Navy Direct Report
Ray Tyler, Executive Sponsor		Eva Clement, CO
Scott Newman, Program Manager		Jimmy Jones, COTR David Pilarski, ACO
Flip Altman, Senior Project Manager		Jimmy Jones, COTR David Pilarski, ACO
Sam Ross, CTO Project Manager		Anthony Robinson, RPM Larry Blackburn, NTR/ROICC John Garner, NSB Kings Bay
CO	Contracting Officer	
COTR	Contracting Officer's Technical Representative	
ACO	Administrative Contracting Officer	
RPM	Remedial Project Manager	
NTR	Navy Technical Representative	
ROICC	Resident Officer in Charge of Construction	

TABLE 2-2

Project Personnel Directory

Contact	Company
R. Scott Newman, Program Manager Flip Altman, Senior Project Manager Marsha Robinson, Contracts Administration Manager Angelo Liberatore, Health and Safety Manager Theresa Rojas, QA/QC Manager	CH2M HILL Constructors, Inc 115 Perimeter Center Place, N.E. Suite 700 Atlanta, GA 30346-1278 770/604-9095
Sam Ross, Project Manager	J.A. Jones Environmental Services Company 8936 Western Way, Suite 10 Jacksonville, FL 32256 904/363-0911
Eva Clement, CO	Southern Division Naval Facilities Engineering Command P.O. Box 190010 North Charleston, SC 29419-9010 843/820-5518
David Pilarski, ACO	843/820-5928
Jimmy Jones, COTR	As above 843/820-5544
Anthony Robinson, RPM	As above 843/820-7339
Cliff Casey, Navy Environmental Technical Support	As above 843/820-5561
Larry Blackburn, NTR/ROICC	Southern Division Naval Facilities Engineering Command Resident Officer in Charge of Construction P. O. Box 139, Building 13 NAS Jacksonville, FL 32212-0139 904/542-5571, ext. 117 904/237-1868 (mobile)
John Garner, NSB Kings Bay Environmental Director	Facilities and Environmental 1063 USS Tennessee Street Building 2015 NSB Kings Bay, Georgia 31547-2606 912/673-2001, ext. 4048

TABLE 3-2
Sampling and Analytical Summary

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method1	Sampling Equipment1	TAT2	DQO Level/Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservtn	Containers
Disposal of Solid Waste													
Solids Disposal	Solid disposal material	Soil	Once per 6 drums; once per container; or as required by disposal facility	As Needed	Dig to approx 6-12" for sample	SS Auger, SS Spoons, SS Bowl	7 days	DQO Level III, CCI Level B	Volatiles	8260B	14 day analysis	Cool to 40C	(1) 4 oz amber glass
									Semi-Volatiles	8270C	14 day extr; 40 day analysis	Cool to 40C	(1) 16 oz amber glass
									Pesticides	8081A	14 day extr; 40 day analysis		
									Herbicides	8151A	14 day extr; 40 day analysis		
									TAL Metals	6010B, 7470A	6 month analysis Hg: 28 day analysis	Cool to 40C	(1) 15 oz amber glass
									TPH	FL-PRO	14 day extr; 40 day analysis		
									PCBs	8082	14 day extr; 40 day analysis		
									Ignitability	1030	ASAP		
									Corrosivity	9045A	ASAP		
									Reactivity	Chapter 7.3	ASAP		

3.3 Waste Characterization and Incidental Wastestream Sampling and Analyses

3.3.1 Soil/Solids Characterization

Waste characterization samples, if necessary, will be collected to evaluate the handling, transportation, and disposal requirements of any contaminated soil accumulated during project activities. It is anticipated that drill cutting soils will be placed in drums or rollofs depending on the volume generated. Soil samples will be collected as follows, delivered to a Navy-, USACE-, or AFCEE-approved laboratory and analyzed for the parameters listed on Table 3-2.

Soil/solids characterization samples will be collected from the drums and/or rollofs prior to disposal. One composite sample will be collected one per six drums, one per rolloff container or as required by the disposal facility. The samples will be collected as follows.

When collecting samples from drums, the volatile sample will be collected from the drums containing the drill cuttings from the most contaminated area(s). The top 6 inches will be removed and the Encore samples will be collected. When collecting samples from rollofs, volatile samples will be collected from most contaminated area within the rolloff (visual staining or odors). Again the top 6 or more inches will be removed and the Encore samples will be collected. Volatile samples will be collected as follows:

1. Open the Encore reusable package and remove the core device and cap.
2. Place into the T-handle and core the sample directly into the exposed soil.
3. Remove from the soil, brush off the sides, and put the cap seal onto the sampler.
4. Label and reseal in the original package.
5. Place into cooler for shipment.

When collecting non-volatile samples from drums, one or more grabs per each of six drums will be collected and placed into a stainless steel bowl. When collecting non-volatile samples from rollofs, at least four grabs will be collected from four points at varying depths using a stainless steel auger.

1. The soil will be blended, coned and quartered using a stainless steel spoon.
2. Fill the appropriate sample jars approximately three-fourths full with the homogenized sample
3. Close the jar, label, and package the sample for shipment to the lab.

A CCI Level B package will be required along with appropriate QC samples for the required waste characterization and incidental wastestream samples. All analytical data will be submitted by both hard copy and electronic files.

3.3.2 Water Characterization

Waste characterization samples, if necessary, will be collected to evaluate the handling, transportation, and disposal requirements of generated decontamination water and any other miscellaneous collected water. It is anticipated that the aqueous waste will be

containerized in drums. Water samples will be collected as follows and delivered to a Navy-, USACE-, or AFCEE-approved laboratory and analyzed for the parameters listed on Table 3-2.

A sample will be collected from the drums using either a dip jar or bailer. The sample containers for volatile analyses will be filled first. The 40-milliliter vials will be filled so that there is no headspace in each vial. The sample containers for the remaining analyses will then be filled.

A CCI Level B package will be required along with appropriate QC samples for the required waste characterization and incidental wastestream samples. All analytical data will be submitted by both hard copy and electronic files.

3.4 Analytical Methods

Samples will be collected for analytical methods summarized in Table 3-2.

Preliminary analytical results will be faxed to the CCI Laboratory Coordinator/Data Management Manager, at the following facsimile number per the turn-around times listed in Table 3-2 from day of sample receipt. The final hardcopy data and electronic file will be delivered to CCI within 14 days of sample receipt. CCI is responsible for reviewing all laboratory analytical data for QA/QC purposes.

CCI Laboratory Coordinator/Data Management Manager
CCI
115 Perimeter Center Place, Suite 700
Atlanta, GA 30346
(770) 604-9182 x268
(678) 604-9282 (fax)

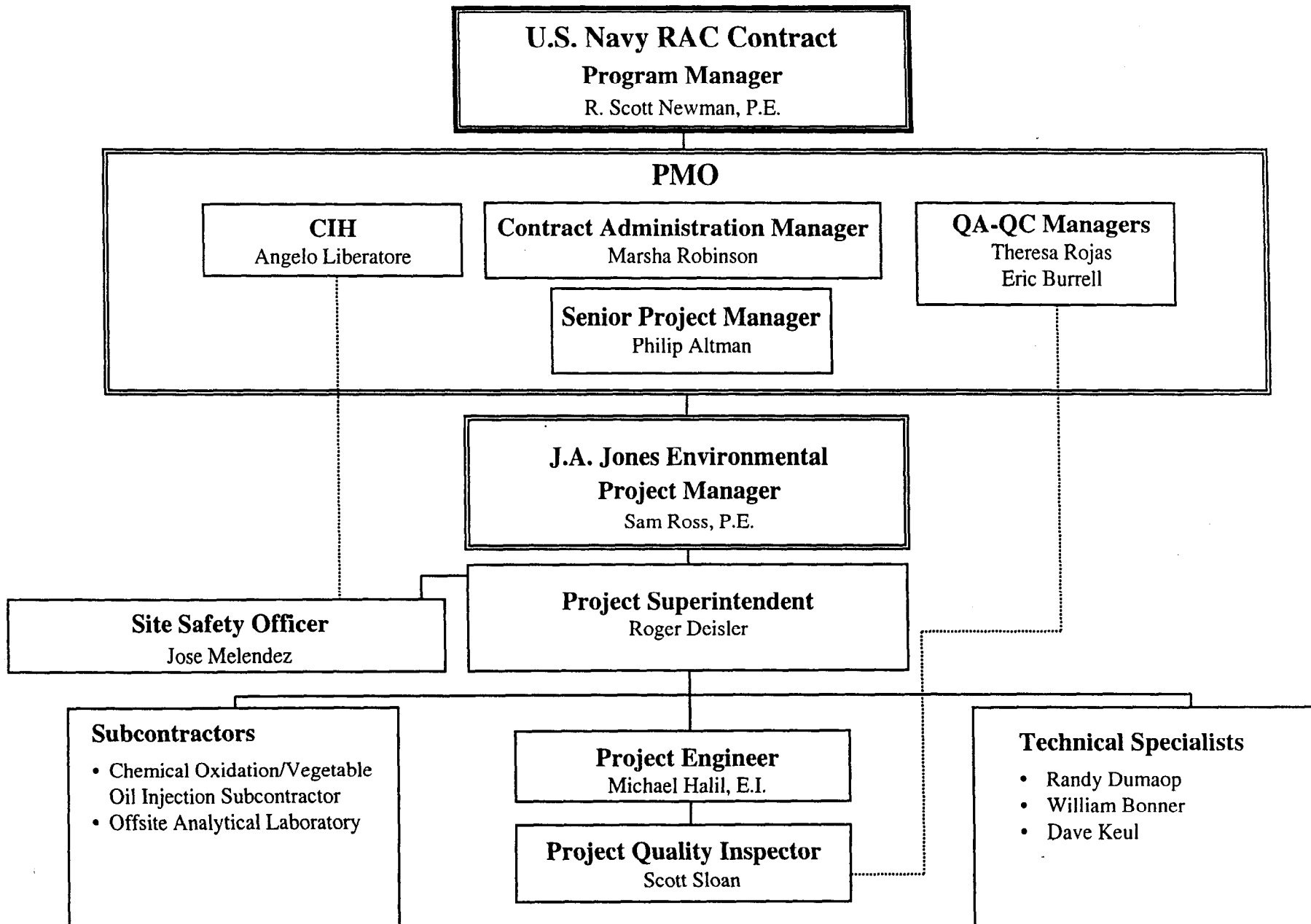
6.0 Quality Control Plan

Section 6.0 Quality Control Plan provided in the CTO No. 0047 Work Plan No. 01 addresses the Quality Control Plan to be instituted during the performance of this CTO at NSB Kings Bay.

The Submittal Register and Testing Plan and Log, included in Appendices B and C, respectively, document submittals for this project phase in accordance with Appendix B of CCI's Contract Management Plan (dated July 1998). CCI, the Navy, or others will approve submittals as identified in the Submittal Register. All approved submittals will be distributed by CCI to the appropriate Navy personnel (CO, ROICC (in duplicate), etc.), to the project site, and to the project file. Additional project QC documents are provided in Appendix C of the CTO No. 0047 Work Plan No. 01.

The site-specific project organization chart (Figure 6-1) depicts the chain-of-command for this CTO and the individuals responsible for executing the work as indicated.

Figure 1
Project Organization Chart
Contract Task Order No. 0047
Groundwater Remediation at Site 11, Old Camden County Landfill



**Health and Safety Plan
Groundwater Remediation at Site 11
Old Camden County Landfill
Naval Submarine Base Kings Bay
Kings Bay, Georgia**

Revision No. 01

**Contract No. N62467-98-D-0995
Contract Task Order No. 0047**

**Submitted to:
U.S. Naval Facilities
Engineering Command
Southern Division**

Prepared by:



CH2MHILL
Constructors, Inc.

115 Perimeter Center Place, N.E.
Suite 700
Atlanta, GA 30346

September 2001

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2	Project-Specific Chemical Product Hazard Communication Form
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3.4 Tick Bites And Mosquito Bites

3.4.1 Ticks

Reference CH2M HILL HS-03, Tick Bites

Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch in size.

Prevention against tick bites includes avoiding tick areas; wearing tightly woven light-colored clothing with long sleeves and wearing pant legs tucked into boots or socks; spraying **only outside** of clothing with insect repellent containing permethrin or permethrin, and spraying skin with DEET; and checking yourself frequently for ticks and showering as soon as possible. To prevent chemical repellents from interfering with sample analyses, exercise care while using repellents during the collection and handling of environmental samples.

If bitten by a tick, carefully remove the tick with tweezers, grasping the tick as close as possible to the point of attachment while being careful not to crush the tick. After removing the tick, wash your hands and disinfect and press the bite area. The removed tick should be saved. Report the bite to human resources personnel.

Look for symptoms of Lyme disease or Rocky Mountain spotted fever (RMSF): Lyme - a rash that looks like a bullseye with a small welt in the center; RMSF - a rash of red spots under the skin 3 to 10 days after the tick bite. In both cases, chills, fever, headache, fatigue, stiff neck, bone pain may develop. If symptoms appear, seek medical attention.

3.4.2 Mosquito Bites

Due to the recent detection of the West Nile Virus in the Southeastern United States it is recommended that **preventative measures** be taken to reduce the probability of being bitten by mosquitoes whenever possible. Mosquitoes are believed to be the primary source for exposure to the West Nile Virus as well as several other types of encephalitis. The following guidelines should be followed to reduce the risk of these concerns for working in areas where mosquitoes are prevalent.

- Stay indoors at dawn, dusk, and in the early evening.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing.
- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35 percent DEET (N,N-diethyl-meta-toluamide). DEET in high concentrations (greater than 35 percent) provides no additional protection.
- Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands.

- Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's DIRECTIONS FOR USE, as printed on the product.

Note: Vitamin B and "ultrasonic" devices are NOT effective in preventing mosquito bites.

Most infections are mild, and symptoms include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands. More severe infection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death.

The West Nile Virus incubation period is from 3 to 15 days.

If you have any questions or to report any suspicious symptoms, contact the project Health and Safety Manager.

3.5 Radiological Hazards and Controls

Refer to CH2M HILL's Corporate Health and Safety Program, Program and Training Manual, and Corporate Health and Safety Program, Radiation Protection Program Manual, for standards of practice for operating in contaminated areas. There are no known radiological hazards associated with this project.

3.6 Hazards Posed by Chemicals Brought on the Site

3.6.1 Hazard Communication

Reference CH2M HILL Hazard Communication Manual

CH2M HILL's *Hazard Communication Program Manual*, which is available from area or regional offices and from the Corporate Human Resources Department in Denver, Colorado. The project manager is to request MSDSs from the client or from the contractors and the subcontractors for chemicals to which CCI employees potentially are exposed. The SHSS is to do the following:

- Give employees required site-specific hazard communication (HAZCOM) training.
- Confirm that inventory of chemicals brought on the site by subcontractors is available.
- Before or as chemicals arrive on the site, obtain an MSDS for each hazardous chemical.
- Label chemical containers with identity of chemical and with hazard warnings, if any.

The chemical products listed in Table 3-4 will be used on the site. Refer to Attachment 2 for MSDSs.

TABLE 3-4
Chemical Hazards

Chemical	Quantity	Location
Hydrogen Peroxide	Tanker or Barrels	Exclusion Zone
Ferrous Sulfate	Barrels	Exclusion Zone
Vegetable Oil	Barrels	Exclusion Zone
Alconox/Liquinox (detergent)	< 1 liter, powder/liquid	Support/Decontamination Zone

3.6.2 Shipping and Transportation of Chemical Products

Reference CH2M HILL's Procedures for Shipping and Transporting Dangerous Goods

Nearly all chemicals brought to the site are considered hazardous materials by the DOT. All staff who ship the materials or transport them by road must receive the CH2M HILL training in shipping dangerous goods. Hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be properly identified, labeled, packed, and documented by trained staff. Contact the HSM or the Equipment Coordinator for additional information.

3.7 Contaminants of Concern

Reference Project Files for More-Detailed Contaminant Information

Contaminants of concern are listed in Table 3-5.

TABLE 3-5
Contaminants of Concern

Contaminant	Maximum ^a Concentration (ppm)	Exposure Limit ^b	IDLH ^c	Symptoms and Effects of Exposure	PIP ^d (eV)
1,2-Dichloroethene	GW: 2 µg/L	200 ppm	1,000 ppm	CNS depression, eye irritation	9.65
Tetrachloroethylene (PCE)	GW: 10,000 µg/L	25 ppm	150 Ca	Eye, nose, and throat irritation; nausea; flushed face and neck; vertigo; dizziness; sleepiness; skin redness; headache; liver damage	9.32
Trichloroethylene (TCE)	GW: 7 µg/L	50 ppm	1,000 Ca	Headache, vertigo, visual disturbance, eye and skin irritation, fatigue, giddiness, tremors, sleepiness, nausea, vomiting, dermatitis, cardiac arrhythmia, paresthesia, liver injury	9.45
Vinyl Chloride	GW: 120 µg/l	1 ppm	NL Ca	Weakness, abdominal pain, gastrointestinal bleeding, enlarged liver, pallor or cyanosis of extremities	9.99

^a Specify sample-designation and media: SB (Soil Boring), A (Air), D (Drums), GW (Groundwater), L (Lagoon), TK (Tank), S (Surface Soil), SL (Sludge), SW (Surface Water).

^b Appropriate value of PEL, REL, or TLV listed.

^c IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen.

^d PIP = photoionization potential; NA = Not applicable; UK = Unknown.

ppm = parts per million

eV = electron volt

3.8 Potential Routes of Exposure

Potential routes of exposure include:

- **Dermal:** Contact with contaminated media. This route of exposure is minimized through proper use of PPE, as specified in Section 5.0.
- **Inhalation:** Vapors and contaminated particulates. This route of exposure is minimized through proper respiratory protection and monitoring, as specified in Sections 5.0 and 6.0, respectively.

- **Other:** Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before eating, drinking, or smoking).

4.0 Personnel

4.1 CCI Employee Medical Surveillance and Training

Reference CH2M HILL SOP HS-01, Medical Surveillance, and HS-02, Health and Safety Training

The employees listed in Table 4-1 are enrolled in the CH2M HILL Comprehensive Health and Safety Program and meet state and federal hazardous waste operations requirements, for 40-hour initial training, 3-day on-the-job experience, and 8-hour annual refresher training. Employees designated "SHSS" have received 8 hours of supervisor and instrument training and can serve as SHSS for the level of protection indicated. An SHSS with a level designation (D, C, B) equal to or greater than the level of protection being used must be present during all tasks performed in exclusion or decontamination zones that involve the potential for exposure to health and safety hazards. Employees designated "FA-CPR" are currently certified by the American Red Cross, or equivalent, in first aid and cardiopulmonary resuscitation (CPR). At least one FA-CPR designated employee must be present during all tasks performed in exclusion or decontamination zones that involve the potential for exposure to health and safety hazards. The employees listed below are currently active in a medical surveillance program that meets state and federal regulatory requirements for hazardous waste operations. Certain tasks (e.g., confined-space entry) and contaminants (e.g., lead) may require additional training and medical monitoring.

Pregnant employees are to be informed of and are to follow the procedures in CH2M HILL's SOP HS-04, *Reproduction Protection*, including obtaining a physician's statement of the employee's ability to perform hazardous activities, before being assigned fieldwork.

TABLE 4-1
Project Personnel Safety Certifications

Employee Name	Office	Responsibility	SHSS/FA-CPR
Mike Halil	JAX	Project Manager	FA-CPR
TBD		Site Superintendent	
Jose Melendez	JAX	SHSS	
Eric Burrell	ATL	QC Manager	Level C SHSS; FA-CPR
Angelo Liberatore	ATL	H&S Manager	Level B SHSS; FA-CPR

4.2 Field Team Chain of Command and Communication Procedures

4.2.1 Client

Contact Name: Eva Clement, Southern Division, NAVFAC, North Charleston, South Carolina

4.2.2 CCI

Project Manager: Mike Halil/J.A. Jones/ JAX

Health and Safety Manager: Angelo Liberatore/ ATL

Site Superintendent: TBD

Site Health and Safety Specialist: TBD

The SHSS is responsible for contacting the site superintendent and the project manager. In general, the project manager either will contact or will identify the client contact. The HSM should be contacted as appropriate. The SHSS or the project manager must notify the client and the HSM when a serious injury or a death occurs or when health and safety inspections by OSHA or other agencies are conducted. Refer to Sections 10 through 12 for emergency procedures and phone numbers.

4.2.3 Subcontractors

Reference Section 3, Corporate Health and Safety Program Manual

When specified in the project documents (e.g., contract), this plan may cover CCI subcontractors. However, this plan does not address hazards associated with tasks and equipment that the subcontractor has expertise in (e.g., operation of drill rig). Specialty subcontractors are responsible for health and safety procedures and plans specific to their work. Specialty subcontractors are to submit plans to CCI for review and approval before the start of fieldwork. Subcontractors must comply with the established health and safety plan(s). CCI must monitor and enforce compliance with the established plan(s).

General health and safety communication with subcontractors contracted with CCI and covered by this plan is to be conducted as follows:

- Request that the subcontractor, if a specialty subcontractor, submit a safety or health plan applicable to their expertise (e.g., drill-rig safety plan or nuclear density gauge [NDG] health plan); attach the reviewed plan.
- Supply subcontractors with a copy of this plan, and brief them on its provisions.
- Direct health and safety communication to the subcontractor-designated safety representative.
- Notify the subcontractor-designated representative if a violation of the plan(s) is observed. Specialty subcontractors are responsible for mitigating hazards in which they have expertise.
- If a hazard condition persists, inform the subcontractor. If the hazard is not mitigated, stop affected work as a last resort and notify the project manager.
- When an apparent imminent danger exists, promptly remove all affected personnel. Notify the project manager.
- Make clear that consistent violations of the health and safety plan by a subcontractor may result in termination of the subcontract.

6.0 Air Monitoring Specifications

Reference CH2M HILL SOP HS-06, Air Monitoring

Air monitoring specifications are listed in Table 6-1.

TABLE 6-1
Air Monitoring Specifications

Instrument	Action Levels ^a	Frequency ^b	Calibration
PID MiniRAE with 10.6eV lamp or equivalent	0 – 25ppm – Level D > 25 ppm – Stop Work	Initially and periodically during task	Daily

^a Action levels apply to sustained breathing-zone measurements above background.

^b The exact frequency of monitoring depends on field conditions and is to be determined by the SHSS; generally, every 5 to 15 minutes is acceptable; more frequently may be appropriate. Monitoring results should be recorded. Documentation should include instrument and calibration information, time and measurement result, personnel monitored, and place/location where measurement is taken (e.g., "Breathing Zone/MW-3," "at surface/SB-2," etc.).

ppm = parts per million

Action Levels will be established in Site Specific HSP, when concentrations for Contaminants of Concern are evaluated.

6.1 Calibration Specifications

Calibration specifications are listed in Table 6-2. Refer to the respective manufacturer's instructions for proper instrument-maintenance procedures.

TABLE 6-2
Calibration Specifications

Instrument	Calibration Gas	Span	Reading	Method
PID: MiniRAE, 10.6 eV bulb	100 ppm isobutylene	CF=53	53 ppm ±5 ppm	1.5 lpm REG T-Tubing

ppm = parts per million

6.2 Air Sampling

Sampling may be required by other OSHA regulations where exposure to certain contaminants may exist. Air sampling typically is required when site contaminants include lead, cadmium, arsenic, asbestos, and certain volatile organic compounds. Contact the HSM immediately if these contaminants are encountered.

6.2.1 Method Description

Real time air monitoring will be performed. Contact HSM if assistance is required.

6.2.2 Personnel and Areas

Results must be sent immediately to the HSM. Regulations may require reporting to monitored personnel. Results reported to: HSM: Angelo Liberatore/ATL.

Distance 1.9 miles

The hospital location map is provided in Figure 11-1.

11.10 Government Agencies Involved in Project

Federal Agency and Contact Name: Naval Facilities Engineering Command

Contact the project manager. Generally, the project manager will contact relevant government agencies.

11.11 Emergency Contacts

If an injury occurs, notify the injured person's personnel office as soon as possible after obtaining medical attention for the injured person. Notification **MUST** be made within 24 hours of the injury. Emergency contacts are listed in Table 11-4.

TABLE 11-4
Emergency Contacts

CCI Medical Consultant Dr. Peter P Greany WorkCare Inc., 333 S. Anita Drive Orange, CA 92868, 800/455-6155 (After-hours calls will be returned within 20 minutes.)	Occupational Physician (Local)
CCI Drug-Free Workplace Program Administrator Alicia Sweeney/ATL 770/604-9095	Site Safety and Health Specialist (SHSS) TBD
Navy RAC Health and Safety Manager (HSM) Angelo Liberatore/ATL 770/604-9095	Project Manager Mike Halil 904/777-4812
Radiation Health Manager (RHM) Dave McCormack/SEA 206/453-5000	Human Resources Manager Nancy Orr /DEN 303/771-0925
Client Eva Clements Naval Facilities Engineering Command	Corporate Human Resources Department Julie Zimmerman/COR 303/771-0900
Federal Express Dangerous Goods Shipping 800/238-5355 CH2M HILL Emergency Number for Shipping Dangerous Goods 800/255-3924	Worker's Compensation and Auto Claims Sterling Administrative Services 800/420-8926 After hours 800/497-4566 Report fatalities & report vehicular accidents involving pedestrians, motorcycles, or more than two cars.

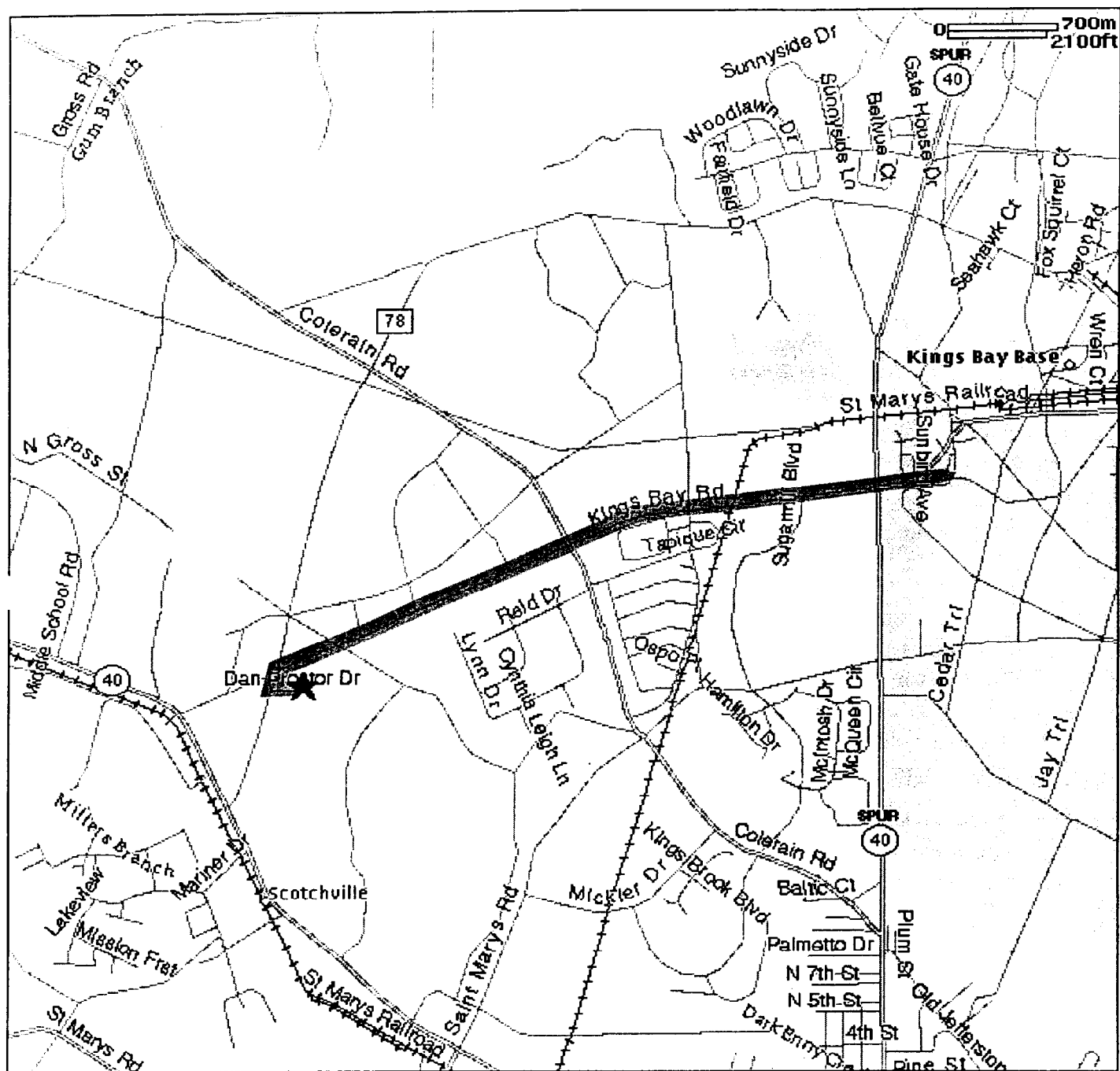


Figure 11-1
Hospital Location Map

12.0 Approval

This site-specific health and safety plan has been written for use by CCI only. CCI claims no responsibility for its use by others unless that use has been specified and defined in project or contract documents. The plan is written for the specific site conditions, purposes, dates, and personnel specified and must be amended if those conditions change.

12.1 Original Plan

Written by:	Robert Nash	Date:	May 2001
Approved by:	Robert Nash	Date:	May 2001

12.2 Revisions

Revisions Made by:	Richard Rathnow	Date:	August 2001
Revisions Approved by:	Angelo Liberatore	Date:	August 2001

Work Plan No. 2

Revision No. 01

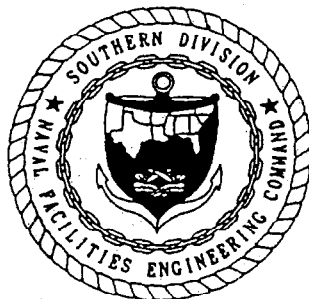
Groundwater Remediation at Site 11, Old Camden County Landfill Naval Submarine Base Kings Bay Kings Bay, Georgia

Contract No. N62467-98-D-0995

Contract Task Order No. 0047

September 2001

PREPARED FOR



Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406

Work Plan No. 02

Groundwater Remediation at
Site 11, Old Camden County Landfill

Naval Submarine Base Kings Bay
Kings Bay, Georgia
Revision 01
Contract No. N62467-98-D-0995
Contract Task Order No. 0047

PREPARED FOR



September 2001